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SANITARY ENGINEERS -- THEIR EARNINGS AND PROFESSIONAL ATTITUDES

by John C. Bumstead and Arthur
D. Caster, Members, ASCE

SANITARY ENGINEERING DIVISION

(Discussion open until December 1, 1955)

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SANITARY ENGINEERS—THEIR EARNINGS AND PROFESSIONAL ATTITUDES

An SED Survey of Professional Problems and Opportunities

John C. Bumstead^a and
Arthur D. Caster,^b Members, ASCE

SYNOPSIS

This is a comprehensive analysis and report on the salary and professional satisfaction survey which was distributed to the Division during March 1955.

It reveals the attitudes of sanitary engineers on professional engineering registration, professional recognition, salaries and incomes compared to length of experience, type of engineering work and employing agency, educational training, and the number of employers and employees in the sanitary engineering field.

The returns, over 58%, of the questionnaires sent out indicate considerable significance in the findings.

Background for the Survey

There has been a repeated demand for a salary and professional satisfaction survey designed especially to define the various elements as applied to sanitary engineers only. No such information is presently available.

The Executive Committee of the Sanitary Engineering Division authorized this survey at its October 1954 meeting in New York City.

The questionnaire, which was designed by the authors, was mailed to the Sanitary Engineering Division membership in March 1955 with the regular mailing of Proceedings-Separates and Newsletter. 2189 questionnaires were sent out. It is based on income received in 1954.

The questionnaire was stenciled and mimeographed on pink paper by the Society headquarters staff in New York City (Pink draws higher returns than white). It was presented to the Division membership by means of a simple sheet of instructions mimeographed on Division white stationery. Included with the two sheets was a white envelope addressed to the Assistant Secretary of the Division. Those replying to the Survey completed the form, placed it in the addressed envelope, added a stamp and mailed the envelope.

A sample of the questionnaire is included with this report as Appendix III.

The instructions called for the completed questionnaire to be returned not later than April 15, 1955. The returns were, therefore, closed on April 18, 1955 with a total count of 1153. This return was utilized for the analyses. Additional returns were received after the closing date and as of June 1, the

a. Cons. Engr., Alfred Le Feber & Associated, Cincinnati, Ohio.

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grand total was 1229 or 56.15%. The totals used in the analyses that follow differ from 1153 because of omissions and errors and instructions not complied with.

The significance of this survey is accentuated by the fact that the returns which are analyzed and presented in this report are based on a 53% report from the Division membership.

A return of 25% from a survey questionnaire is considered good. Therefore, this survey is considered to be based on excellent data.

References:

- 1) The Composition of the Sanitary Engineering Profession
Walter A. Lyon and Arthur P. Miller
Scientific Manpower Series No. 2
Federal Security Agency. Office of Education.
- 2) The Professional Earnings and Career Satisfaction of A I Ch E Members.
J. A. Polack, G. E. Montes and L. B. Smith
Chemical Engineering Progress, May 1953 (Vol. 49, No. 7)
- 3) Survey of Salaries for Civil Engineering Positions, ASCE
Report of Committee on Salaries, Spring 1953
Civil Engineer July 1953 (Vol. p. 469)

The completed questionnaires filed according to state and country together with the tabulation sheets, summaries and other work sheets are now on deposit with the Headquarters Office of the ASCE where they may be examined upon request to the Executive Secretary of the Society.

Exhibit No. 1

**SURVEY RETURNS ARE DIVIDED NEARLY EQUAL
ACCORDING TO MEMBERSHIP GRADE**

Membership grade

The three classes of Society membership are represented in this survey in about equal proportions. (Exhibit No. 1.)

EXHIBIT NO. 1

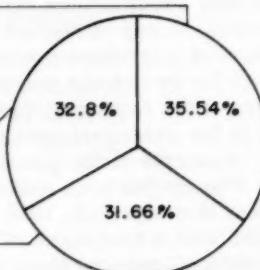
ASCE MEMBERSHIP GRADE

JUNIOR — 402

ASSOCIATE — 371

MEMBER — 358

TOTAL — 1131



However, for the first time in an SED investigation the greatest response has come from the Junior Members. This may indicate their considerable interest in improving their economic and professional status, or reflect an influx of young well-educated sanitary engineers into this professional council.

The Junior Members are articulate in this survey; their comments pull no punches. There are things they don't like and don't accept, but significantly like the older membership classes they do not suggest any solutions or ways to improve the conditions they criticize.

Certainly the greatest interest in professional development and recognition is among the young sanitary engineers who have yet to make their reputations and establish themselves with and without the profession.

EXHIBIT NO. 2

DISTRIBUTION
BY
EDUCATIONAL BACKGROUND

NO DEGREE - 75

MASTER - 331

DOCTOR - 43

BACHELOR - 647

TOTAL - 1096

Exhibit No. 2

SANITARY ENGINEERS HAVING A BACHELOR
DEGREE PREDOMINATE IN THIS SURVEY

Education and salary

Of the sanitary engineers reporting, 59% have a Bachelor's degree; 30.2% have a Master's Degree and 3.9% have a Doctor's degree; but 6.8% have no degree at all. (Exhibit No. 2.)

There appears to be no correlation between degrees held and income. The distribution for employees in the three 'degree' classifications appears to be the same for the various salary ranges. The men who have the least experience receive the lowest salaries. As they develop, become more proficient and have more to offer in productivity, their incomes increase.

**DISTRIBUTION
BY
ENGINEERING REGISTRATION**

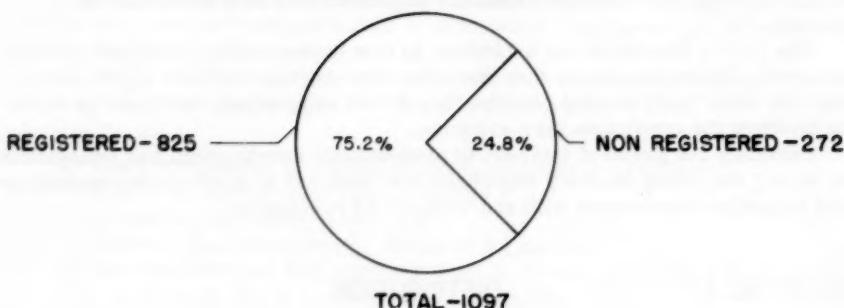


Exhibit No. 3

**THE RATIO OF REGISTERED TO NON-REGISTERED
SANITARY ENGINEERS IS 3 TO 1**

Engineering registration—A large number of sanitary engineers fail to appreciate the value of professional registration (24.8%). This means that these 'engineers' cannot practice on their own responsibility and that they are not legally recognized as engineers. (Exhibit No. 3.)

It would seem that there should be no more than 5% of the sanitary engineers without registration. This would include those in training and those who did not obtain registration under the grandfather clauses and now find it too rigorous to qualify by examination.

Sanitary engineers cannot expect recognition unless they publicly demonstrate their qualifications and competence to practice by achieving registration through examination (any other way is inimical to professional status). Certification, it is hoped, will provide another upward step for professional qualification.

It is noteworthy that substantial numbers of 'sanitary engineers' who hold a master's or a doctor's degree are not registered and are complaining about their salaries and professional recognition. This condition is not shown by a tabulation or graph because of space limitations, but the evidence is given on the questionnaires.

Exhibit No. 4

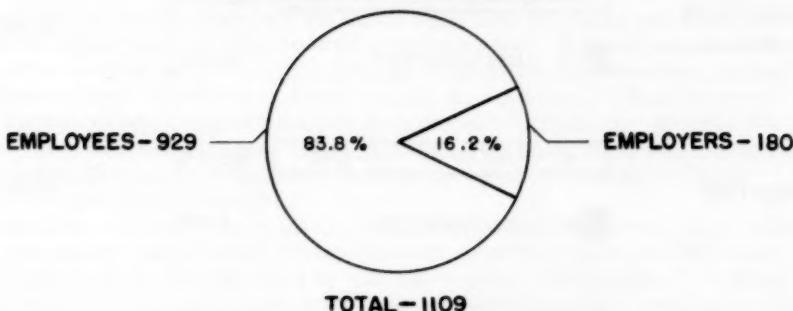
**THE EMPLOYER-EMPLOYEE RELATIONSHIP IS ONE
DISTINGUISHING CHARACTERISTIC OF
SANITARY ENGINEERING**

Engineering Employers and Engineering Employees:

When 84% of the membership of a profession are employed by the other 16%, the problem of professional recognition both within and without the profession can be critical. (Exhibit No. 4).

The medical, legal and dental professions—in contra-distinction to engineering generate their strength and independence from self-employed

**DISTRIBUTION
BY
EMPLOYERS AND EMPLOYEES**



practitioners. Individuals in these professions exercise their independent judgment and are successful in proportion to their competency and acceptance by the public; they accept full responsibility for their acts and decisions as independent practitioners. They enjoy confidential relationships with their clients. The engineer does not.

The employer-employee relationship in engineering practice plus these significant distinctions from other professions must be fully appreciated before any solution can be suggested for the problem of professional recognition.

Development of the successful sanitary engineering business more and more depends upon the supplying of a variety of technical skills and competencies to the corporate or groups-of-people client. Hence, the employer-employee relationship in engineering will continue as it has in the past.

Exhibit No. 5

**SANITARY ENGINEERS ARE GENERALLY HAPPY IN THEIR
CHOICE OF A CAREER AND THEIR POSITIONS—BUT
MORE THAN ONE-THIRD (1/3) ARE DISSATISFIED
WITH THEIR SALARIES**

Professional satisfaction

Sanitary engineers appear to be happy and contented with their technical pursuits and engineering practice. Their questionnaires indicate that they find personal satisfaction and technical challenge in their work. They like their positions and the work they are presently doing. (Exhibit No. 5.)

Income

But a substantial percentage (36%) are dissatisfied with their salaries. Sanitary engineering has long been known for its inadequacy of financial return. The survey substantiates this fact: sanitary engineering employees in general do not enjoy rewarding salaries.

There is, however, ample opportunity for substantial financial return for those who own consulting business and achieve a sound professional reputation. (Exhibit No. 6B).

EXHIBIT NO. 5

PROFESSIONAL SATISFACTION

	SATISFACTORY	1023	RETURN 93.3%	NUMERICAL (1096)
CAREER AS A WHOLE	<input checked="" type="checkbox"/> 73 UNSATISFACTORY		6.7%	
POSITION	<input checked="" type="checkbox"/> SATISFACTORY	1022	92.4%	(1106)
	<input checked="" type="checkbox"/> 84 UNSATISFACTORY		7.6%	
SALARY	<input checked="" type="checkbox"/> SATISFACTORY	701	63.4%	(1105)
	<input checked="" type="checkbox"/> 101 UNSATISFACTORY		36.6%	
PROFESSIONAL RECOGNITION	<input checked="" type="checkbox"/> SATISFACTORY	853	77.5%	(1101)
	<input checked="" type="checkbox"/> 24 UNSATISFACTORY		22.5%	
RECOGNIZED AS PROFESSIONAL BY EMPLOYER	<input checked="" type="checkbox"/> SATISFACTORY	971	90.6%	(1071)
	<input checked="" type="checkbox"/> 101 UNSATISFACTORY		9.4%	

Professional recognition

Almost one-quarter (22.5%) of the sanitary engineers find that professional recognition is unsatisfactory. (Exhibit No. 5.)

In the questionnaire, professional recognition was not defined. So these words may have meant different things to different engineers. Some of those reporting back (and commenting) interpreted this as social recognition,—or recognition by the public,—or recognition by other professions. Recognition by other professions is, of course, a sore point with sanitary engineers in the public health field. This is a special problem which will only be resolved by time and competence in practice although certification of sanitary engineers, if developed with the necessary self discipline and strength of character, can materially aid those in public health work.

The results of this questionnaire reveal that the sanitary engineers in substantial numbers feel that they are not appreciated. Perhaps this is the result of technical specialization and a widespread lack of understanding of what the sanitary engineer is and does. Unless this fact (plus salary dissatisfaction) is recognized by professional leaders as well as employers, it is reasonable to assume that it could contribute to unionism in one form or another. There is reported a formidable percentage of engineers who are not averse to unionism and who may be considering it as a solution to their economic problems.

In any case, the sanitary engineer will continue to demonstrate weakness if he accedes to his disgruntledness and resorts to 'griping'; it should be apparent that the practical way to achieve recognition is hard work to build his and his profession's reputation and to earn what he thinks is rightful recognition. This cannot be bestowed or granted by fiat. And this achievement cannot be reached by devotion to technical pursuits alone. However, it must be conceded that something is fundamentally wrong when 22.5% of the sanitary engineers are disgruntled about professional recognition. (Exhibit No. 5)

One engineer commented: "Obviously there has been some question about the satisfaction sanitary engineers derive from their 'vocation' or there would not have been a survey.

"Sanitary engineers are a small group. They render a service, as a rule, on a community basis rather than to persons. Further, there are extremely wide variations in the work done by this small group. Consequently it is not surprising that the public—and even allied professional groups—do not understand the nature of the work done by sanitary engineers,—or exactly what their contribution is to society. As a matter of fact, I believe some sanitary engineers are a bit confused and uncertain, and nearly all are craving the professional recognition which only a small minority ever received."

Employer recognition

It is no less than tragic that almost 10% of the sanitary engineers declare emphatically that their employers do not recognize them as professional people. But it is to be noted that a large percentage of this group are not yet professional people in the legally accepted sense because of their failure to be registered. (Exhibit No. 5.)

However, among chemical engineers a total of 6.4% reported that their employers do not recognize them as professional people (A I Ch E survey, Chemical Engineering Progress, July 1953).

The recent ASCE survey indicating that a significant percentage of engineers thought that some form of union might be desirable could be a manifestation of employee resentment. This condition is difficult to solve. Each side will accuse the other; but it is to the elders of the profession that the new men are looking for guidance, respect and leadership and above all the disciplined exemplification of the practice of true professional engineering. This is indicated by the comments.

Experience and salary for employees

The bulk of employed sanitary engineers, as would be expected, appear to receive increases in income as they acquire experience in their specialty and develop reliable judgment and productivity of value to their employers.

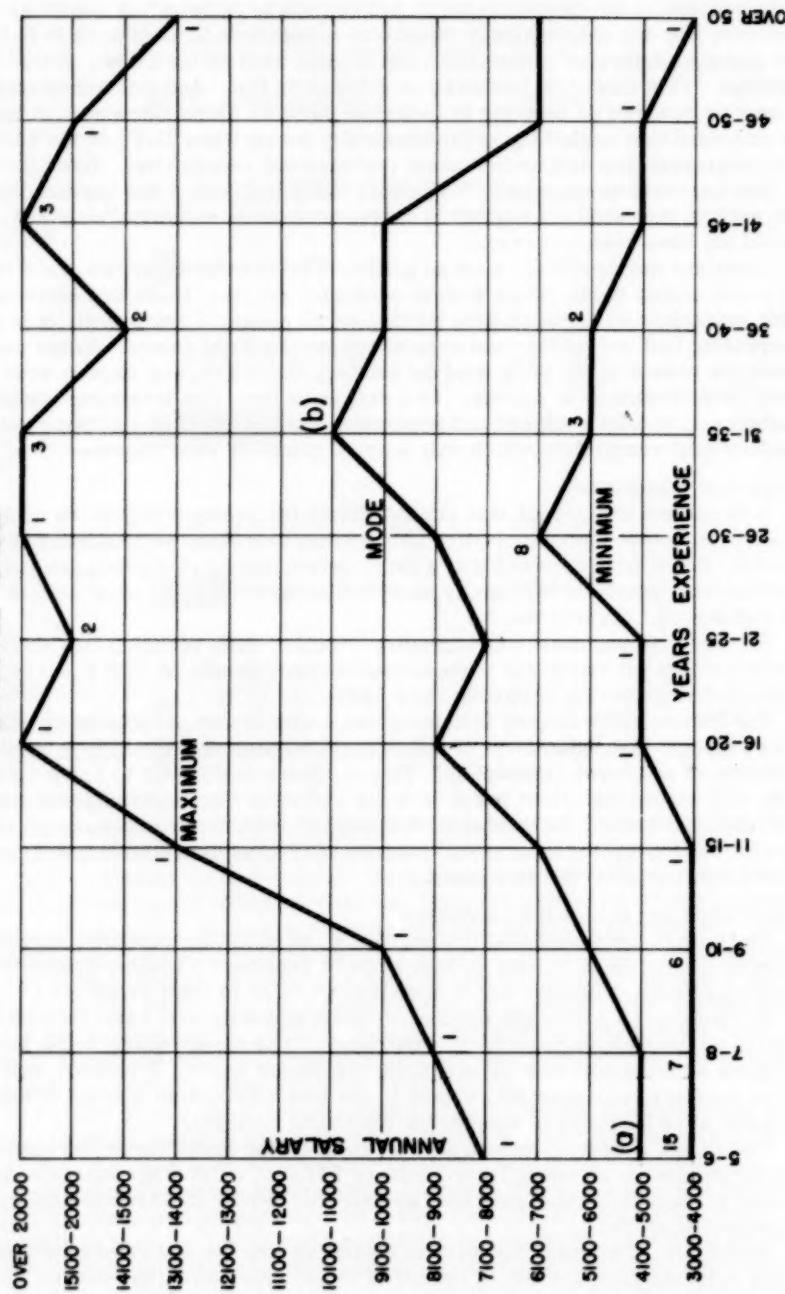
Exhibit No. 6A shows the maximum, mode and minimum salaries received for the various classifications of experience. The mode—which is the most frequent or most common value—is the significant curve. It appears that some sanitary engineers may expect to receive a maximum income of about \$11,000 after 35 years of experience (including college).

Taking the lowest (a) and highest (b) point on the mode curve and considering the income to increase from \$4100 to \$11,000, an average increase in salary of about \$230 per year may be expected during 35 years of employee-engineering practice.

There are, of course, exceptional engineers who for one reason or another enjoy salaries considerably in excess of those indicated by the mode. They appear to start at about \$8000 per year and rise to about \$20,000 after 16 to 20 years of practice. They seem to hold these high incomes with little varia-

EXHIBIT NO. 6-A

SALARY VS. EXPERIENCE
EMPLOYEE GROUP



tion after the 20 year period. (The number reporting for the maximum and minimum is shown in the circles).

Sanitary engineers who make up the minimum bracket may remain in the \$3000 to \$4000 salary range for 15 years and rise to a maximum of \$6000 to \$7000 during the 26 to 30 year experience interval.

The bulk of sanitary engineers who are employees and technical designers for the most part appear to be receiving income somewhat below those that might be expected for the training, degree of competence and productivity demanded of them. It is suggested that this condition is becoming known and is a basic cause of the reported decrease in interest in sanitary engineering as a professional career.

Experience and Income for Employers

While the data is not adequately distributed to give a significant curve, Exhibit No. 6B—Salary vs Experience—has been plotted with the number reporting in each experience range shown in the small circles.

Analysis of the data reported show these facts, however: Of the employers, 5.5% received income between \$14,100 and \$15,000; 12.2% received income between \$15,100 and \$20,000; and 39.5% reported a 1954 income of more than \$20,000.

These facts demonstrate the rewards inherent in risk taking, ownership of engineering firms, and the full acceptance of the legal and moral responsibility for practicing professional sanitary engineering.

Exhibit No. 7

Field of endeavor and employing agency

One interesting finding is that 46.5% of the sanitary engineers reporting in this survey are working for governmental units. But 53.5% are serving private enterprise, including consulting engineering firms, utilities, industry and construction (Exhibit No. 7).

The consultants have, as expected, the highest number of sanitary engineers—38.7%. Industry has 7.6% and utilities—6.5%.

Based on field of endeavor (or function), 32.6% of the sanitary engineers are technical designers.

In management as a consultant-employer, and as governmental or industrial supervisors, there are 20.2% sanitary engineers.

Educational institutions have a complement of 10.7% sanitary engineers; this does not include those working in research and development for various agencies.

A number of sanitary engineers are connected with plant operation—about 8.1%, the largest portion of those are working for utilities and local governments.

Sanitary engineers serving public health activities amount to 19.4% of the total answering the questionnaire. This would seem to indicate that about 1/5 of all sanitary engineers are working in public health agencies, which are under the control and domination of other professions.

'Sales' engineers responding to the survey totaled 3.7%. Perhaps it is significant that as many 'sales' engineers find it either desirable or rewarding to maintain an affiliation with a professional engineering organization, which makes no effort to have exhibits at conventions and which prohibits special entertainment by sales personnel.

EXHIBIT NO. 6-B

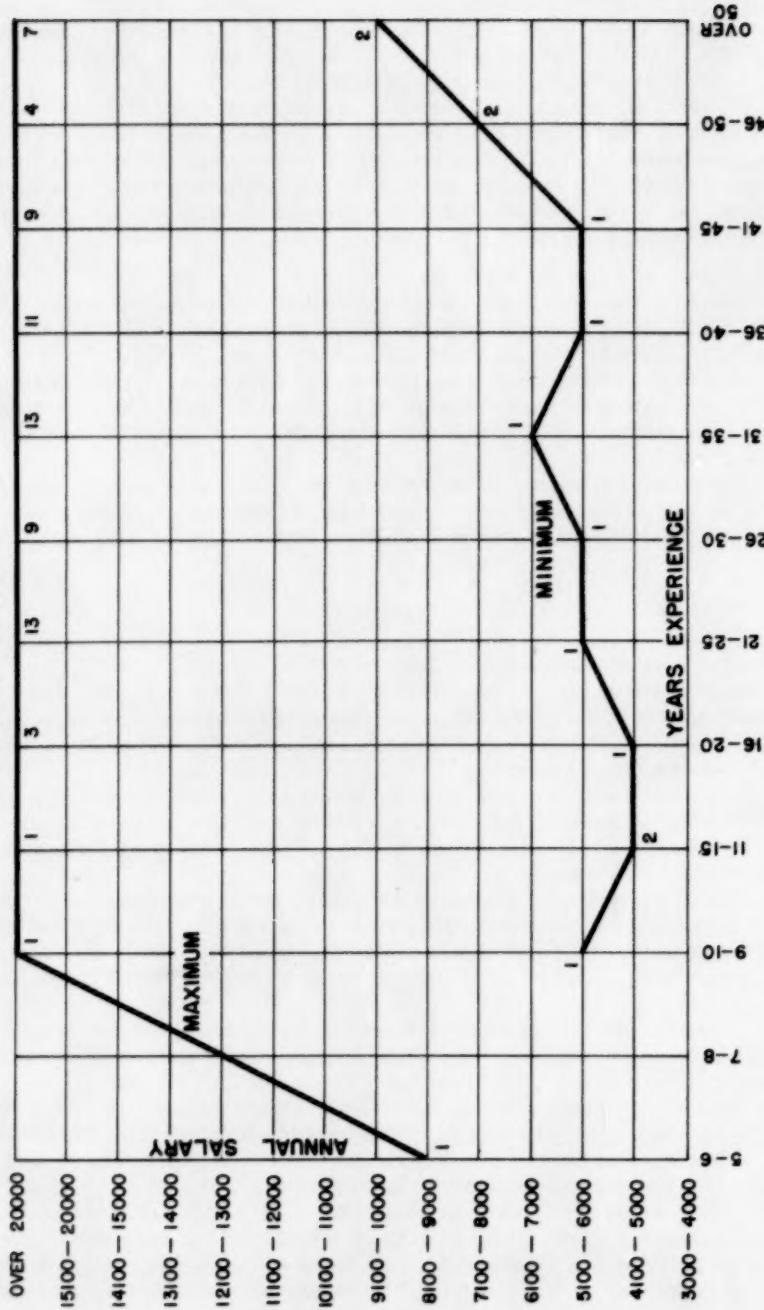
SALARY VS. EXPERIENCE
EMPLOYER GROUP

EXHIBIT NO. 7

EMPLOYING AGENCY	FIELD OF ENDEAVOR							Management	Sales	Education	Plant Operation	Drafting	Technical Design	Research
	Development	Development	Technical Design	Drafting	Plant Operation	Education	Sales							
Federal Government	8	6	22	1	8	2	6	66						
State Government	8	1	5		2	106	1	103						
Local Government	6	25	2	48	9	46	53							
Consulting Engineering	1	3	300	6	2	5	128							
Utility	2	20		28	1	36								
Industry	3	6	5	5		43	12	1						
Construction		4				5								

SUMMARY AND CONCLUSIONS

In general the results of this survey reveal that sanitary engineers are satisfied with their careers and engineering practiced, but that they are troubled and confused about the problems of employer-employee relationships, income, incentives and professional recognition.

It is regrettable that the salaries of sanitary engineers compare unfavorably with those of other engineering classifications. Some are leaving for construction or sales. This is a condition which has been long recognized by some who, nevertheless, found adequate personal rewards in the practice of sanitary engineering.

As the sanitary engineers are coming to appreciate their secondary position in income matters, there appears to be developing economic pressures which will cause increasing defections from engineering to other activities with greater incentive and reward.

The earnings of sanitary engineers increase through the years with wide individual variations in income. The variations appear to have no relationship to degree, field of endeavor, or size of firm. The performance of the individual engineer, his personality and his ability to get along with people, therefore must be assumed to account for the wide variations in income.

Teachers generally have low salaries which they are supplementing by outside consulting activities. The reports of such 'extra' activity are widespread.

Technical designers, being employees, received salaries that are considerably below those of management and owners who report the highest incomes.

Perhaps the problems revealed in this survey do not apply to the sanitary engineers alone, and require a united engineering front. In his recent article "What's Wrong with Engineering Education?", Herman L. Danforth, M. ASCE, City Engineer, Rockford, Illinois says "Many of the problems facing the professional engineer—low pay, difficulty in securing recognition of professional status, common lack of knowledge and appreciation on the part of the public of the engineer's contribution to society—will tend to solve themselves when the graduate engineer emerges as a man of broadened interests and understanding and with the ability to express himself effectively."

Isn't there some way to speed up the development of the engineer to a mature disciplined professional person wherein recognition and financial rewards will come naturally?

APPENDICES

- Appendix I SED Membership by States and Countries and Survey returns.**
- Appendix II Distribution by Field of Endeavor and Salaries.**
- Appendix III Sample of Questionnaire.**
- Appendix IV Recommendations for future surveys.**

APPENDIX I.

Questionnaires Mailed and Returned - Tabulated by Locality

State or Country	Mailed	Returned	Processed
Alabama	18	13	11
Alaska	7	7	5
Arizona	13	7	6
Arkansas	14	5	5
Arabia	2	0	0
Australia	6	1	0
California	235	143	133
Connecticut	31	20	19
Colorado	14	11	11
Canada	12	7	7
Canal Zone	2	1	0
Colombia	7	1	0
Costa Rica	1	1	0
Cyprus	1	0	0
Delaware	10	7	6
Ecuador	1	0	0
Egypt	1	0	0
England	4	3	2
Florida	52	32	31
Formosa	1	0	0
Georgia	33	18	18
Germany (British zone)	1	0	0
Greece	1	1	0
Guatemala	1	0	0
Idaho	6	4	3
Illinois	105	64	62
Indiana	43	27	27
Iowa	31	16	16
India	10	1	0
Iran	1	0	0
Iraq	1	0	0
Israeli	2	0	0
Jordan	1	1	0
Kansas	36	16	16
Kentucky	14	8	8
Louisiana	14	11	11
Lebanon	2	1	0
Massachusetts	72	33	32
Maine	8	4	4

APPENDIX I.

Questionnaires Mailed and Returned - Tabulated by Locality

State or Country	Mailed	Returned	Processed
Maryland	82	45	43
Michigan	79	35	35
Minnesota	21	13	12
Mississippi	7	5	4
Missouri	62	45	44
Montana	2	0	0
Malaya	2	0	0
Mexico	1	1	1
Nevada	3	2	2
Nebraska	13	11	10
North Carolina	27	11	9
North Dakota	6	2	2
New Mexico	6	3	3
New Hampshire	3	2	2
New Jersey	85	37	36
New York	228	133	124
The Netherlands	1	1	1
Newfoundland	1	0	0
Nicaragua	2	0	0
New Zealand	4	1	0
North Borneo	1	0	0
Morocco (French)	1	0	0
Oklahoma	21	10	10
Oregon	39	26	24
Ohio	100	61	59
Pennsylvania	105	74	71
Pakistan	1	0	0
Panama	1	0	0
The Philippines	2	1	1
Puerto Rico	7	2	1
Rhode Island	13	4	2
South Dakota	7	4	4
South Carolina	20	5	5
South Africa	6	0	0
Spain	1	0	0
Sweden	1	0	0
Switzerland	2	1	0
Syria	1	1	0
Tennessee	38	24	24
Texas	71	39	37
Thailand	2	0	0

APPENDIX I.

Questionnaires Mailed and Returned - Tabulated by Locality

State or Country	Mailed	Returned	Processed
Utah	15	11	10
Virginia	52	25	25
Vermont	4	3	2
Venezuela	15	5	3
Wyoming	3	1	1
West Virginia	10	4	3
Washington	76	47	44
Wisconsin	41	27	26
Washington, D. C.	32	25	25
Wales	1	0	0
Hawaii	8	5	4
APO - Addresses	33	16	12
TOTAL -	2189	1229	1153
Percentage -		56.15	54.91

APPENDIX II

DISTRIBUTION BY FIELD OF ENDEAVOR AND SALARY

Field of Endeavor	Salary Range	\$3000	\$4100	\$5100	\$6100	\$7100	\$8100	\$9100	\$10100	\$11100	\$12100	\$13100	\$14100	\$15100	over \$20000		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
Research	4	2	4	6	4	2	2	2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	
Development		5	5	6	1	4	3		1/2		1/2		1		1		
Technical Design	1	4	2	44	2	78	2	58	3	46	5	31	4	16	18	2	8
Drafting	4	3	3	1/2			1/2		1							1	
Plant Operation	4	7	20	22	10	13	7	7	7	7	7	7	7	7	7	7	
Education	6	8	3	14	14	12	4	6	1	6	1	6	1	6	1/2	4	4
Sales	1	5	6	8	7	1	3	3	1		2	1	2	1	2	1	1
Management	2	1	2	8	2	4	6	11	4	6	6	21	9	13	5	6	7
Public Health	5	45	43	30	25	1	30	25	10	25	10	25	10	2	2	3	1
Fed. Gov't.	9	13	12	19	11	16	11	11	2	2	2	2	1	1	1	1	
State Gov't.	7	27	3	39	26	30	14	22	13	2	7	4	1	1/2	2	1	
Local Gov't.	4	23	38	29	20	19	12	10	4	4	4	2	1	2	1	1	
Consult. Engg.	5	3	33	2	62	2	42	6	36	6	27	12	20	11	20	6	7
Utility	1	6	1	12	1	11	8	2	8	6	1	2	1	3	3	2	1
Industry	1	2	6	8	9	1	9	1	3	4	1	4	2	1	2	2	3
Construction										1	2				1	1	

* A - Employer
B - Employed

Majority of fractions have been dropped

APPENDIX III - SAMPLE OF QUESTIONNAIRE

PROFESSIONAL EARNINGS AND SATISFACTION SURVEY
FOR SANITARY ENGINEERS

Check or fill in each question only in one space. Give the correct answer.

1. ASCE grade: Jr. (); Assoc. M. (); Member (); Affiliate ()

2. Age ____; 3. Location _____ State); 4. Registration: Yes () No ().

5. Degrees: Bachelor (); Master (); Doctors (); No degree ().

6. Professional experience in years: 5-6 (); 7-8 (); 9-10 (); 11-15 ();
16-20 (); 21-25 (); 26-30 (); 31-35 ();
36-40 (); 41-45 (); 46-50 (); over 50 ().

7. Earnings in 1954: \$3000-4000 (); 4100-5000 (); 5100-6000 (); 6100-7000 ();
7100-8000 (); 8100-9000 (); 9100-10000 (); 10100-11000 ();
11100-12000 (); 12100-13000 (); 13100-14000 ();
14100-15000 (); 15100-20000 (); over 20,000 ().

8. Are you an employer () or employee (),

9. Number of employees in the immediate organization you are connect with _____

10. Field of endeavor: Research (); development (); technical design (); drafting ();
plant operation (); education or teaching (); consulting ();
sales (); management (); health department federal (); state ();
local (); utility ();

11. Professional satisfaction:

a. Has sanitary engineering been a satisfactory career for you to date? Yes ();
No ()

b. Check how each of the following have affected you:

1. Position	Satisfactory _____	: Unsatisfactory _____
2. Salary	Satisfactory _____	: Unsatisfactory _____
3. Professional recognition	Satisfactory _____	: Unsatisfactory _____
4. Other	Satisfactory _____	: Unsatisfactory _____

c. Does your employer recognize you as a professional person? Yes (); No ().

PLEASE COMPLETE THIS QUESTIONNAIRE AND MAIL TO: Arthur D. Caster
Asst. Secretary SED-ASCE,
38 Arcadia Place
Cincinnati 6, Ohio

Use the enclosed addressed envelope DO IT NOW Before April 15, 1955

Your cooperation in supplying this information on an impersonal basis will help to
advance the status of the sanitary engineer.

APPENDIX IV

Suggestions for Future Questionnaire

- Suggestion No. 1 Include a question such as "How much do you think you should be earning at the present time?" This should be compared with actual earnings.
- Suggestion No. 2 Include instructions for Question No. 10 to the effect that two check marks be made; one for the actual type of work performed (as technical design or drafting); the other for the agency (as consultant or health dept.).
- Suggestion No. 3 When surveying the attitudes on professional recognition, professional recognition should be more completely defined. Engineers appear to hold somewhat varying ideas about recognition, i.e.; by the employers? by the public? by other profession? and even social recognition is mentioned in the comments received in this survey.
- Suggestion No. 4 Include a question asking for specific recommendations for the correction of problems and 'gripes' set forth in the comments. (The 'gripes' in this survey were extensive but there were very few constructive recommendations as to what might be done for improvement of the alleged conditions and attitudes.)
- Suggestion No. 5 Request actual salary received to be reported rather than having salary indicated in ranges as was done in this survey. This would permit closer mathematical analysis of salary data.



PROCEEDINGS PAPERS

The technical papers published in the past year are presented below. Technical-division sponsorship is indicated by an abbreviation at the end of each Paper Number, the symbols referring to: Air Transport (AT), City Planning (CP), Construction (CO), Engineering Mechanics (EM), Highway (HW), Hydraulics (HY), Irrigation and Drainage (IR), Power (PO), Sanitary Engineering (SA), Soil Mechanics and Foundations (SM), Structural (ST), Surveying and Mapping (SU), and Waterways (WW) divisions. For titles and order coupons, refer to the appropriate issue of "Civil Engineering" or write for a cumulative price list.

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AUGUST: 466(HY), 467(HY), 468(ST), 469(ST), 470(ST), 471(SA), 472(SA), 473(SA), 474(SA), 475(SM), 476(SM), 477(SM), 478(SM)^c, 479(HY)^c, 480(ST)^c, 481(SA)^c, 482(HY), 483(HY).

SEPTEMBER: 484(ST), 485(ST), 486(ST), 487(CP)^c, 488(ST)^c, 489(HY), 490(HY), 491(HY)^c, 492(SA), 493(SA), 494(SA), 495(SA), 496(SA), 497(SA), 498(SA), 499(HW), 500(HW), 501(HW)^c, 502(WW), 503(WW), 504(WW)^c, 505(CO), 506(CO)^c, 507(CP), 508(CP), 509(CP), 510(CP), 511(CP).

OCTOBER: 512(SM), 513(SM), 514(SM), 515(SM), 516(SM), 517(PO), 518(SM)^c, 519(IR), 520(IR), 521(IR), 522(IR)^c, 523(AT)^c, 524(SU), 525(SU)^c, 526(EM), 527(EM), 528(EM), 529(EM), 530(EM)^c, 531(EM), 532(EM)^c, 533(PO).

NOVEMBER: 534(HY), 535(HY), 536(HY), 537(HY), 538(HY)^c, 539(ST), 540(ST), 541(ST), 542(ST), 543(ST), 544(ST), 545(SA), 546(SA), 547(SA), 548(SM), 549(SM), 550(SM), 551(SM), 552(SA), 553(SM)^c, 554(SA), 555(SA), 556(SA), 557(SA).

DECEMBER: 558(ST), 559(ST), 560(ST), 561(ST), 562(ST), 563(ST)^c, 564(HY), 565(HY), 566(HY), 567(HY), 568(HY)^c, 569(SM), 570(SM), 571(SM), 572(SM)^c, 573(SM)^c, 574(SU), 575(SU), 576(SU), 577(SU), 578(HY), 579(ST), 580(SU), 581(SU), 582(Index).

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JANUARY: 583(ST), 584(ST), 585(ST), 586(ST), 587(ST), 588(ST), 589(ST)^c, 590(SA), 591(SA), 592(SA), 593(SA), 594(SA), 595(SA)^c, 596(HW), 597(HW), 598(HW)^c, 599(CP), 600(CP), 601(CP), 602(CP), 603(CP), 604(EM), 605(EM), 606(EM)^c, 607(EM).

FEBRUARY: 608(WW), 609(WW), 610(WW), 611(WW), 612(WW), 613(WW), 614(WW), 615(WW), 616(WW), 617(IR), 618(IR), 619(IR), 620(IR), 621(IR)^c, 622(IR), 623(IR), 624(HY)^c, 625(HY), 626(HY), 627(HY), 628(HY), 629(HY), 630(HY), 631(HY), 632(CO), 633(CO).

MARCH: 634(PO), 635(PO), 636(PO), 637(PO), 638(PO), 639(PO), 640(PO), 641(PO)^c, 642(SA), 643(SA), 644(SA), 645(SA), 646(SA), 647(SA)^c, 648(ST), 649(ST), 650(ST), 651(ST), 652(ST), 653(ST), 654(ST)^c, 655(SA), 656(SM)^c, 657(SM)^c, 658(SM)^c.

APRIL: 659(ST), 660(ST), 661(ST)^c, 662(ST), 663(ST), 664(ST)^c, 665(HY)^c, 666(HY), 667(HY), 668(HY), 669(HY), 670(EM), 671(EM), 672(EM), 673(EM), 674(EM), 675(EM), 676(EM), 677(EM), 678(HY).

MAY: 679(ST), 680(ST), 681(ST), 682(ST)^c, 683(ST), 684(ST), 685(SA), 686(SA), 687(SA), 688(SA), 689(SA)^c, 690(EM), 691(EM), 692(EM), 693(EM), 694(EM), 695(EM), 696(PO), 697(PO), 698(SA), 699(PO)^c, 700(PO), 701(ST)^c.

JUNE: 702(HW), 703(HW), 704(HW)^c, 705(IR), 706(IR), 707(IR), 708(IR), 709(HY)^c, 710(CP), 711(CP), 712(CP), 713(CP)^c, 714(HY), 715(HY), 716(HY), 717(HY), 718(SM)^c, 719(HY)^c, 720(AT), 721(AT), 722(SU), 723(WW), 724(WW), 725(WW), 726(WW)^c, 727(WW), 728(IR), 729(IR), 730(SU)^c, 731(SU).

JULY: 732(ST), 733(ST), 734(ST), 735(ST), 736(ST), 737(PO), 738(PO), 739(PO), 740(PO), 741(PO), 742(PO), 743(HY), 744(HY), 745(HY), 746(HY), 747(HY), 748(HY)^c, 749(SA), 750(SA), 751(SA), 752(SA)^c, 753(SM), 754(SM), 755(SM), 756(SM), 757(SM), 758(CO)^c, 759(SM)^c, 760(WW)^c.

AUGUST: 761(BD), 762(ST), 763(ST), 764(ST), 765(ST)^c, 766(CP), 767(CP), 768(CP), 769(CP), 770(CP), 771(EM), 772(EM), 773(SA), 774(EM), 775(EM), 776(EM)^c, 777(AT), 778(AT), 779(SA), 780(SA), 781(SA), 782(SA)^c, 783(HW), 784(HW), 785(CP), 786(ST).

c. Discussion of several papers, grouped by Divisions.

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